<u>**REMARKS**</u>

This amendment and related remarks that follow are intended to place the subject application in condition for allowance. Specifically, Claims 24 and 26 were amended. No new matter is introduced as a result of these amendments. In view of the amendments and the following reasoning for allowance, the applicants hereby respectfully request further examination and reconsideration of the subject application.

1. <u>Objection to the Claim 26</u>

Claim 26 was objected to for the use of the phrase "are boosted between about 25 percent to less than 1 percent". More particularly, the term "about" was objected to as being ambiguous. In response, the applicants have deleted this word for the claim. In addition, the phrase "less than 1 percent" was objected to as being ambiguous as well. It was stated that the ambiguity arises from not knowing if negative numbers are allowed. However, a percentage of something by its nature cannot be negative. Thus, the phrase "less than 1 percent" must be interpreted as ranging from 0 percent to a percentage less than one. This is not ambiguous. As such the phase was not changed.

In view of the amendment deleting the word "about" and the foregoing explanation as to why the phrase "less than 1 percent" is not ambiguous, it is respectfully requested that the objection to Claim 26 be withdrawn.

It is noted that in addition to the amendment to Claim 26, a typographical error was corrected in Claim 24. More particularly, the word "employing" was replaced with the intended word "applying".

2. <u>Non-Acceptance Of The Color Drawings</u>

It is noted that a petition for color drawings and associated fees and papers were already filed. These papers were filed concurrently with the application on March 9,

2004. To date the applicants have not received a disposition on this petition. Any assistance the Examiner can give to expedite a decision on the petition would be greatly appreciated.

3. **Provisional Double Patenting Rejection of Claims 1, 24 and 30**

Claims 1, 24 and 30 were provisionally rejected under 35 USC §101 as allegedly claiming the same invention as Claim 10 of copending Application No. 2005/0200921. More particularly, it was first stated that Claim 10 of the copending application recites a computer-implemented process for correcting the color of improperly colored pixels of an image, and that this was the same as the preamble to the rejected claims (i.e., "A computer-implemented process for correcting the exposure of improperly exposed pixels of an image"). In response, it is noted that in general pixel intensity increases as the exposure time increases. In addition, the intensity of a pixel in the context of a color image is determined based on the dimensions of the color space model employed. For example, in RGB color scheme, the intensity of a pixel is determined by the color level of the three components—namely red, green and blue. Thus, when the exposure of an improperly exposed pixel is corrected, the intensity of that pixel will change. However, this does not mean that if the pixel is also improperly colored, correcting the exposure will correct the color. Generally, the intensity will change, and so the color levels will change--but the proportion of each color component, which determines the overall color of the pixel, will not change.

It was next stated that the element of the rejected claims reading, "linearly expanding the dynamic range of the intensity levels of the image pixels so as to match the full dynamic intensity range available to a desired degree", was the same as the phrase from Claim 10 of the copending application reading "linearly expanding the dynamic range". However, Claim 10 of the co-pending application recites that linearly expanding the dynamic range includes:

"computing new lowermost and uppermost levels for the channel with the

wider dynamic color level range that reflect the degree to which it is desired for the channel with the narrower range to match the channel with the wider range, and employing the new lowermost and uppermost levels of the channel with the wider dynamic color level range and the lowermost and uppermost levels of the channel with the narrower range to establish a linear color correction transform that maps each old color level to a new color level; applying the linear color correction transform to the color channel with the narrower range for each pixel of the image.

Expanding the color range of a color channel having a narrower range than another of the color channels would change the intensity values of the pixels. However, this would not result in a linear expansion of the dynamic range of the intensity levels of the image pixels so as to match the full dynamic intensity range available to a desired degree.

Finally, it was stated that the elements of the rejected claims reading, "determining whether the linearly expanded intensity levels of the image pixels are evenly distributed; and whenever the linearly expanded intensity levels of the pixels are determined not to be evenly distributed, applying a correction factor to the linearly expanded intensity level of each pixel in the image to produce a corrected intensity value for each pixel and evenly distributed intensity levels", was the same as the element from Claim 10 of the copending application reading "applying the linear color correction transform to the color channel with the narrower range for each pixel of the image". First, applying a linear color correction transform to a color channel has nothing to do with "determining whether the linearly expanded intensity levels of the image pixels are evenly distributed". There is simply no determination of any kind made in the act of applying a linear color correction transform to a color channel. In addition, while applying a linear color transform to a color channel would change the intensity values of the pixels, it would not "produce a corrected intensity value for each pixel and evenly distributed intensity levels".

In view of the forgoing, it is clear that the rejected claims are not claiming the

same thing as Claim 10 of the aforementioned copending application. Therefore, it is respectfully requested that the provisional rejection of Claims 1, 24 and 30 under 35 USC §101 be reconsidered.

4. Rejection of Claims 1, 5, 6, 10, 11, 24, 25, 27 and 30 Under 35 USC §102(b)

Claims 1, 5, 6, 10, 11, 24, 25, 27 and 30 were rejected under 35 USC §102(b) as being anticipated by Lin, U.S. Patent No. 5,812,286. The Office Action asserted that Lin discloses each and every element of the applicants' claimed invention. The applicants respectfully disagree.

In regard to Claims 1, 5, 6, 10, 11 and 30, these claims include an element reading "linearly expanding the dynamic range of the intensity levels of the image pixels so as to match the full dynamic intensity range available to a desired degree". The Lin reference does not teach this element. The only time the Lin teachings result in a change to the intensity values of pixels in an image is in connection with step 40 (see Col. 3, lines 46-60 and Fig. 2). This step changes the color level of each color channel using a non-linear transform. This is evidenced by the curves shown in Fig. 7 which are used in look-up table form to change the color component of each pixel. Notice that the curves are not straight lines and so not linear.

Additionally, the Lin reference does not teach the claimed element reading "determining whether the linearly expanded intensity levels of the image pixels are evenly distributed". Nowhere in the Lin reference is the even distribution of pixel intensity values mentioned, or even suggested. Granted, the Examiner equates a curve fitting step of Lin to the claimed determination. More particularly, the Examiner states that the curve fitting modifies the image only when the original image does not already fit the curve, i.e., when pixel levels are not evenly distributed. However, the applicants claim "applying a correction factor to the linearly expanded intensity level of each pixel in the image to produce a corrected intensity value for each pixel and evenly distributed intensity levels". This is done "whenever the linearly expanded intensity levels of the pixels are determined not to be

evenly distributed". This is inherently different than performing a curve fitting procedure that would allegedly result in no change when the pixel levels are not evenly distributed. In the Examiner's scenario the image is always processed using the curve fitting step, regardless of whether the pixel levels are evenly distributed. This would result in a cost of processing and potential for the addition of noise to an image where no change is needed. In the claimed process, the foregoing is avoided by first "determining whether the linearly expanded intensity levels of the image pixels are evenly distributed", and then "applying a correction factor" whenever "the linearly expanded intensity levels of the pixels are determined not to be evenly distributed". Thus, the claimed process is clearly different from the Lin teachings, and has advantages not recognized in the reference.

The Examiner also implies that Lin's curve fitting procedure creates an equal distribution of intensity levels as claimed by the applicants. It is the applicants' position that this is not the case. Nowhere in the Lin reference is it suggested that its curve fitting procedure results in an equal distribution of pixel intensity levels.

A prima facie case of anticipation is established only when the Examiner can show that the cited reference teaches each of the claimed elements of a rejected claim. In this case, Lin lacks a teaching of the applicants' claimed linear expansion, determining and application features. Thus, the rejected claims recite features that are not taught in cited art, and as such a prima facie case of anticipation cannot be established. It is, therefore, respectfully requested that the rejection of Claims 1, 5, 6, 10, 11 and 30 be reconsidered based on the novel claim language exemplified in Claim 1:

> "linearly expanding the dynamic range of the intensity levels of the image
> pixels so as to match the full dynamic intensity range available to a
> desired degree; determining whether the linearly expanded intensity levels
> of the image pixels are evenly distributed; and whenever the linearly
> expanded intensity levels of the pixels are determined not to be evenly
> distributed, applying a correction factor to the linearly expanded intensity
> level of each pixel in the image to produce a corrected intensity value for

each pixel and evenly distributed intensity levels".

In regard to Claims 24, 25 and 27, these claims include elements reading "establish[ing] a linear intensity correction transform that maps the original intensity level of each pixel in the image to a linearly expanded intensity level, [and] apply[ing] the linear intensity correction transform to each pixel of the image". The Lin reference does not teach these elements. As stated previously, the only time the Lin teachings result in a change to the intensity values of pixels in an image is in connection with step 40 (see Col. 3, lines 46-60 and Fig. 2). This step changes the color level of each color channel using a non-linear transform. This is evidenced by the curves shown in Fig. 7 which are used in look-up table form to change the color component of each pixel. Notice that the curves are not straight lines and so not linear.

Additionally, the Lin reference does not teach the claimed element reading "determine whether the linearly expanded intensity levels of the image pixels are evenly distributed". Nowhere in the Lin reference is the even distribution of pixel intensity values ever mentioned. Granted, as stated previously, the Examiner equates a curve fitting step of Lin to the claimed determination. More particularly, the Examiner states that the curve fitting modifies the image only when the original image does not already fit the curve, i.e., when pixel levels are not evenly distributed. However, the applicants claim "applying a gamma correction factor to the linearly expanded intensity level of each pixel in the image to produce a corrected intensity value for each pixel". This is done "whenever the linearly expanded intensity levels of the pixels are determined not to be evenly distributed". This is inherently different than performing a curve fitting procedure that would allegedly result in no change when the pixel levels are not evenly distributed. In the Examiner's scenario, the image is always processed using the curve fitting step, regardless of whether the pixel levels are evenly distributed. This would result in a cost of processing and potential for the addition of noise to an image where no change is needed. In the claimed process, the foregoing is avoided because it is first "determine[d] whether the linearly expanded intensity levels of the image pixels are evenly distributed", and then "applying a gamma correction factor" whenever "the linearly expanded intensity levels of the pixels are

determined not to be evenly distributed". Thus, the claimed process is clearly different from the Lin teachings, and has advantages not recognized in the reference.

Here again, the Examiner also implies that Lin's curve fitting procedure creates an equal distribution of intensity levels as claimed by the applicants. As before, it is the applicants' position that this is not the case. Nowhere in the Lin reference is it suggested that its curve fitting procedure results in an equal distribution of pixel intensity levels.

Thus, Lin lacks a teaching of the applicants' claimed establishing, applying, determining and application features. Accordingly, the rejected claims recite features that are not taught in cited art, and as such a prima facie case of anticipation cannot be established. It is, therefore, respectfully requested that the rejection of Claims 24, 25 and 27 be reconsidered based on the novel claim language exemplified in Claim 24:

> "employ the originally computed lowermost and uppermost intensity levels and the new lowermost and uppermost intensity levels to establish a linear intensity correction transform that maps the original intensity level of each pixel in the image to a linearly expanded intensity level, apply the linear intensity correction transform to each pixel of the image, determine whether the linearly expanded intensity levels of the image pixels are evenly distributed, and whenever the linearly expanded intensity levels of the pixels are determined not to be evenly distributed, applying a gamma correction factor to the linearly expanded intensity level of each pixel in the image to produce a corrected intensity value for each pixel.".

5. Rejection of Claims 2-4, 7, 21 and 22 Under 35 USC §103(a)

Claims 2 and 3 were rejected under 35 USC §103(a) as being obvious over Lin in view of Hyodo, U.S. Patent No. 6,018,589. Claim 4 was rejected under 35 USC §103(a) as being obvious over Lin in view of Hyodo, and in further view of Iguchi et al., U.S. Patent

Application Publication No. US 2001/0007599 (hereinafter Iguchi). Claim 7 was rejected under 35 USC §103(a) as being obvious over Lin in view of Gindele et al., U.S. Patent Application Publication No. US 2003/0228064 (hereinafter Gindele). Claim 21 was rejected under 35 USC §103(a) as being obvious over Lin in view of Liu et al., U.S. Patent Application Publication No. US 2004/0190789 (hereinafter Liu). And finally, Claim 22 was rejected under 35 USC §103(a) as being obvious over Lin in view of Liu, and in further view of Kuo et al., U.S. Patent No. 5,982,926 (hereinafter Kuo). It was contended in the Office Action that Lin teaches all the elements of the rejected claims with the exception of various claimed features that were contended to be taught in above cited secondary references. Thus, it was concluded that it would have been obvious to incorporate the teachings of the secondary references into Lin to produce the applicants' claimed invention. The applicants respectfully disagree with these contentions of obviousness based on the language of Claim 1 (i.e., the base claim for all these rejected claims).

As stated previously, Lin lacks a teaching of the applicants' claimed linear expansion, determining and application features. The Hyodo, Iguchi, Gindele, Liu and Kuo references also lack these features.

In order to deem the applicant's claimed invention unpatentable under 35 USC §103, a prima facie showing of obviousness must be made. To make a prima facie showing of obviousness, all of the claimed elements of an applicant's invention must be considered, especially when they are missing from the prior art. If a claimed element is not taught in the prior art and has advantages not appreciated by the prior art, then no prima facie case of obviousness exists. The Federal Circuit court has stated that it was error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein (*In Re Fine*, 837 F.2d 107, 5 USPQ2d 1596 (Fed. Cir. 1988)).

In the foregoing cases, the cited combinations lack a teaching of the applicants' claimed linear expansion, determining and application features. Thus, the applicants have claimed features not taught in the cited combinations, and which has advantages

not recognized therein as described previously. Accordingly, no prima facie case of obviousness can be established in accordance with the holding of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 USC §103(a). It is, therefore, respectfully requested that the rejection of Claims 2-4, 7, 21 and 22 be reconsidered based on the previously quoted non-obvious claim language exemplified in Claim 1.

6. Rejection of Claims 29 Under 35 USC §103(a)

Claim 29 was rejected under 35 USC §103(a) as being obvious over Lin in view of Liu. It was contended in the Office Action that Lin teaches all the elements of the rejected claims with the exception of the claimed gamma correction feature. However, it was further contended that this feature is taught in Liu. Thus, it was concluded that it would have been obvious to incorporate the teachings of Liu into Lin to produce the applicants' claimed invention. The applicants respectfully disagree with this contention of obviousness based on the language of Claim 24 (i.e., the base claim for the rejected claim).

As stated previously, Lin lacks a teaching of the applicants' claimed establishing, applying, determining and application features. The Liu reference also lacks these features. Thus, the applicants have claimed features not taught in the cited combination, and which has advantages not recognized therein as described previously. Accordingly, no prima facie case of obviousness can be established in accordance with the holding of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claim is patentable under 35 USC §103(a). It is, therefore, respectfully requested that the rejection of Claim 29 be reconsidered based on the previously quoted non-obvious claim language exemplified in Claim 24.

7. The Objections to Claims 8, 9, 12-20, 23, 26 and 28

Claims 8, 9, 12-20, 23, 26 and 28 were objected to as being dependent upon a rejected base claim. The Examiner stated that they would be allowable if rewritten in
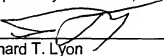
independent form including all of the limitations of the base claim and any intervening claims. However, at this time the applicants respectfully decline to rewrite the objected to claims because it is their position that the independent claims from which these claims depend are patentable.

8. Summary

In view of the amendments and arguments set forth above, the applicants respectfully submit that Claims 1-30 are in condition for allowance as they are patentable subject matter, as well as novel and nonobvious over the cited art. Accordingly, further examination and reconsideration of these claims is respectfully requested and allowance of at an early date is courteously solicited.

Respectfully submitted,

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